

REMARKS

The Examiner has indicated that the claims of the present application are unpatentable over **Allaei** in view of **Shoureshi**.

The Examiner alleges, in relation to Claim 35, that **Allaei** discloses "*noise control device for a glass window in a building comprising an audio frequency sensor attachable to a surface of said window.*" The **Allaei** arrangement has the sensor located between the edge of the window pane and the frame, and is thus sensing the vibrations that are transmitted between the pane and the frame. Further the sensor needs to be located between the glass and the frame when the window is being installed -- the device of the present invention does not require any modification of the window; it can be installed on any existing window by simply attaching it to the window surface - i.e., the face of the window, rather than an edge.

Claim 35 has been amended to specifically claim that the sensor is "**attachable to a face pane surface of said window interior of outer edges of said window....**"

Next, the Examiner states that **Alliae** discloses "*including processing means for detecting in a received signal a predetermined characteristic of noise external to said building.*" There is a disclosure of piezoelectric sensor 710 that "produces voltage Vout that is indicative of the vibratory motion or force" (Col 5, lines 62-64), and Figure 10 and the corresponding description at Col 6, line 58 to Col 7, line 33, indicates that a controller receives the signals from a vibration sensor "*indicative of vibrations adjacent periphery 140 of the windowpane 110.*" There is no disclosure of detecting a predetermined characteristic of noise external to the building as is claimed in amended Claim 35.

Further yet, the Examiner states that **Alliae** discloses "*for generating a cancellation signal and for supplying said cancellation signal to an audio frequency actuator directly attached to the glass of the window and adapted to couple said signal into the glass to cause the glass to radiate the acoustic antiphase signal into the building to reduce the perceived intensity of the external noise in the building.*" **Allaei** discloses creating via the piezoelectric or SMA material actuator an impedance or stiffness discontinuity adjacent periphery 140 of a single windowpane 110 that is vibrating due to sound waves impinging thereon. "*The stiffness discontinuity acts to*

modify the vibration energy distribution within the windowpane 110." There is no suggestion, however, that an antiphase signal is generated or that the glass is caused to radiate the signal.

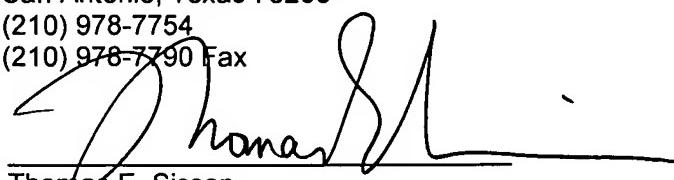
Thus, Allaei focuses on damping around the frame to dissipate the vibrational energy generated by noise in the pane. The present invention is concerned with opposing the vibration **in the plane of the pane** (and not perpendicular thereto as in Allaei) with an equal and opposite vibration with 180 degree phase difference to cancel the transmission (sound pressure wave). In other words, the present invention seeks to null the vibration, while Allaei seeks to damp it by controlling the stiffness of the connection between the pane and the frame through "discontinuity elements".

In the present invention, the face pane surface of the window (i.e. that which extends over the window opening, rather than an edge of the glass) is caused to vibrate with an antiphase signal generated according to the detected noise signal. The use of an audiofrequency actuator directly attached to the window surface (rather than to an edge) permits coupling of the vibrations into the plane of the windowpane to set up standing waves in the pane, and so the cancellation effect is observed in a wide range of frequencies and across the whole of the window, rather than being localised at the window frame.

The Applicant asks the Examiner to reconsider the claim in light of the amendments and arguments presented herein and requests that a Notice of Allowance be issued.

Respectfully submitted,

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Shirley McIntyre

